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## **Determinants of Service Contract Outcomes**

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## Preface & Acknowledgements

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During his internship with the Graduate School of Business & Public Policy in June 2010, U.S. Air Force Academy Cadet Chase Lane surveyed the activities of the Naval Postgraduate School's Acquisition Research Program in its first seven years. The sheer volume of research products—almost 600 published papers (e.g., technical reports, journal articles, theses)—indicates the extent to which the depth and breadth of acquisition research has increased during these years. Over 300 authors contributed to these works, which means that the pool of those who have had significant intellectual engagement with acquisition issues has increased substantially. The broad range of research topics includes acquisition reform, defense industry, fielding, contracting, interoperability, organizational behavior, risk management, cost estimating, and many others. Approaches range from conceptual and exploratory studies to develop propositions about various aspects of acquisition, to applied and statistical analyses to test specific hypotheses. Methodologies include case studies, modeling, surveys, and experiments. On the whole, such findings make us both grateful for the ARP's progress to date, and hopeful that this progress in research will lead to substantive improvements in the DoD's acquisition outcomes.

As pragmatists, we of course recognize that such change can only occur to the extent that the potential knowledge wrapped up in these products is put to use and tested to determine its value. We take seriously the pernicious effects of the so-called “theory–practice” gap, which would separate the acquisition scholar from the acquisition practitioner, and relegate the scholar's work to mere academic “shelfware.” Some design features of our program that we believe help avoid these effects include the following: connecting researchers with practitioners on specific projects; requiring researchers to brief sponsors on project findings as a condition of funding award; “pushing” potentially high-impact research reports (e.g., via overnight shipping) to selected practitioners and policy-makers; and most notably, sponsoring this symposium, which we craft intentionally as an opportunity for fruitful, lasting connections between scholars and practitioners.

A former Defense Acquisition Executive, responding to a comment that academic research was not generally useful in acquisition practice, opined, “That's not their [the academics'] problem—it's ours [the practitioners']. They can only perform research; it's up to us to use it.” While we certainly agree with this sentiment, we also recognize that any research, however theoretical, must point to some termination in action; academics have a responsibility to make their work intelligible to practitioners. Thus we continue to seek projects that both comport with solid standards of scholarship, and address relevant acquisition issues. These years of experience have shown us the difficulty in attempting to balance these two objectives, but we are convinced that the attempt is absolutely essential if any real improvement is to be realized.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the Acquisition Research Program:

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James B. Greene, Jr.  
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD  
Associate Professor



## Panel 8 – Issues in Services Contracting

Wednesday, May 11, 2011	
1:45 p.m. – 3:15 p.m.	<p><b>Chair: Rear Admiral David F. Baucom, USN</b>, Deputy Assistant Secretary of the Navy, Acquisition &amp; Logistics Management</p> <p><b><i>Determinants of Service Contract Outcomes</i></b></p> <p>Tim Hawkins and Gregory Hildebrandt, NPS, and William Muir, USAF, 771st Enterprise Sourcing Squadron</p> <p><b><i>An Evaluation of IDIQ Contracts for Services</i></b></p> <p>William Lucyshyn, Jacques Gansler, and Amelia Corl, University of Maryland</p> <p><b><i>Performance-Based Life Cycle Product Support: A New Look at Enablers and Barriers</i></b></p> <p>Tom Edison and Andre Murphy, DAU</p>

**Rear Admiral David F. Baucom**—Rear Admiral Baucom became the deputy assistant secretary of the Navy (Acquisition and Logistics Management) in September 2009. He provides policy and oversight to all Navy and Marine Corps contracting and acquisition logistics efforts and serves as the Department of Navy's competition advocate and standardization executive. He is responsible for facilitating and improving the acquisition system by developing innovative processes and tools and proactively acquiring, interpreting, and sharing business intelligence and best practices.

Prior to assuming his current position, he served as assistant deputy chief of staff for Fleet Readiness and Training/Fleet supply officer at U.S. Fleet Forces Command. He had previously served as commanding officer, Fleet and Industrial Supply Center, Norfolk. A native of Blythewood, S.C., Baucom graduated with a Bachelor of Science degree in Industrial Management from Auburn University, where he received his commission through the Naval ROTC program in 1981. He also fulfilled all requisites for a second Bachelor of Science degree in Personnel Management And Industrial Relations from Auburn. He earned a Master of Science degree in Acquisition and Contract Management from the Naval Postgraduate School and a second Master of Science degree in National Resource Strategy from the Industrial College of the Armed Forces at the National Defense University.

He is a graduate of the Executive Program at the Darden Graduate School of Business Administration at the University of Virginia and a graduate of the Executive Program in Logistics and Technology at the Kenan-Flagler Business School at the University of North Carolina at Chapel Hill. He is a certified Level III acquisition professional in the contracting career field; a certified professional contracts manager in the National Contract Management Association; and a graduate of the Senior Acquisition Course at the Defense Acquisition University. He is a Lean Six Sigma Executive Green Belt, a qualified naval aviation supply officer, and a designated joint specialty officer.

Baucom served in a variety of key leadership positions afloat and ashore. At sea, he served as supply officer, USS *Edward McDonnell* (FF 1043); stock control officer, USS *Theodore Roosevelt* (CVN 71); and as the first supply officer in USS *Ronald Reagan* (CVN 76). Joint duty assignments include duty as the deputy assistant chief of staff for logistics at the Headquarters, Supreme Allied Command Transformation and in the Joint Staff, the Pentagon. Additionally, he served at the Fleet and Industrial Supply Center, Yokosuka, Japan; in the Office of Supply Corps Personnel; and in the Enlisted Plans Division at the Bureau of Naval Personnel. He served as the executive assistant to the deputy commander for Logistics in the Naval Supply Systems Command; in the Space and Naval Warfare Systems Command; and as a White House military aide to President and Mrs. Ronald Reagan.



## Determinants of Service Contract Outcomes

**Tim Hawkins**—Lt Col, USAF, PhD. Lt Col Hawkins is an Assistant Professor at the Naval Postgraduate School in Monterey, CA. He directs and teaches in the Strategic Purchasing program aimed at transforming military procurement. Lt Col Hawkins has published articles on opportunism in buyer-supplier relationships and on electronic reverse auctions in scholarly publications such as the *Journal of Supply Chain Management*, *Industrial Marketing Management*, *Supply Chain Management: An International Journal*, the *Journal of Marketing Channels*, *Air Force Journal of Logistics*, and the *Journal of Public Procurement*. His current research interests include electronic reverse auctions, procurement ethics, buyer-supplier relationships, strategic sourcing, and services procurement. [tghawkin@nps.edu]

**Gregory Hildebrandt**—Visiting Associate Professor, NPS. Dr. Hildebrandt returned to the Naval Postgraduate School in 2008. Previously, beginning in 2000, he was a Senior Economist at the RAND Corporation specializing in Operating and Support cost estimation and the analysis of Selected Acquisition Report data. He spent most of the 1990s at the Naval Postgraduate School teaching a variety of economics and operations research courses. Prior to this faculty position at NPS, Dr. Hildebrandt was a Senior Economist at the RAND Corporation specializing in Soviet-Military Economics. He retired from the Air Force, and his assignments included OSD(PA&E), the Central Intelligence Agency, the Air Force Academy faculty, and Procurement Officer at Ballistic Systems Division (BSD). At BSD, his areas of expertise included multiple incentive contracting and source selection. Dr. Hildebrandt holds a PhD in Economics from Princeton and an MS in Operations Research from USC. He is a graduate of the USAF Academy. [gghildeb@nps.edu]

**William Muir**—Capt, USAF. Hildebrandt is a Strategic Sourcing Analyst at Wright-Patterson Air Force Base in Dayton, OH. In this capacity, he supports the Air Force Civil Engineer Commodity Council to shape the Air Force's acquisition and management of civil engineering requirements. He is currently deployed to Southwest Asia. [william.muir@us.af.mil]

### Abstract

The need for reform in the Department of Defense's (DoD) acquisition and management of services acquisitions was recently highlighted by the Government Accountability Office and by the DoD's top leaders in acquisition. The for-profit sector also struggles with the effective acquisition of services in which the complexities and unique nature of services render the definition of requirements and the specification and measurement of contractor performance problematic. Despite these difficulties, little research has been conducted to examine the determinants of sourcing performance in services acquisitions. This study examines the relationships between service quality and its antecedents through the use of structural equation modeling. Data were collected from 240 U.S. Air Force contract administrators. Results suggest that requirement definition sufficiency and communication strongly affect service quality and regulatory and statutory compliance. A negative relationship is found between the extent of compliance with regulations and statutes and service quality. Other results include a significant relationship between the level of commitment by the internal customer and the sufficiency of the requirement definition, as well as the deleterious effects of personnel turnover on compliance with regulations and statutes. The paper concludes with several managerial implications, limitations to the study, and directions for future research.





## Introduction

Over the past several decades, the United States transitioned from a goods-based to a services-based economy. As of 2005, services accounted for more than 78% of the country's gross domestic product and employed 80% of the country's workforce (Coalition of Service Industries [CSI], 2007). Federal spending on services has also sharply increased. The Department of Defense (DoD) obligated 212 billion dollars on service contracts during 2009, an amount that accounted for more than 50% of the DoD's contract spend (USD[AT&L], 2010a, b).

Yet, the size of the DoD's acquisition workforce has decreased in recent years despite these substantial increases in spend on contract services. The DoD's spend on services acquisitions in real dollars grew more than 100% between 2001 and 2008, increasing from 92 to more than 200 billion dollars, while the DoD's contracting workforce grew only 1%, and the DoD's total acquisition workforce shrank nearly 3% (Government Accountability Office [GAO], 2009d). The GAO contends that the DoD carried out this downsizing without regard to retention of specific skills and competencies needed to accomplish the department's mission (GAO, 2007a), such as those skills required to manage increasingly complex service contracts.

At the same time that demand for services has rapidly increased within the DoD, so have the demands on service contract administrators. Some of this burden can be attributed to the uniqueness of services—the properties of intangibility, heterogeneity, perishability of output, and simultaneity of production and consumption which differentiate services from the acquisition of goods (Ellram, Tate, & Billington, 2007). Because of these properties, it is more difficult to control quality levels, more difficult to evaluate quality, more difficult to manage service personnel, and more difficult to manage time, which is the process of synchronizing the resources required for service delivery with the time of consumption (Lovelock & Wirtz, 2007).

### ***DoD's Service Contract Management Woes***

Recently, the GAO released a barrage of criticism of the DoD's service contract management. In 2001, the GAO labeled the DoD's acquisition of services as "high risk," stating that the department's poor management of service contracts undermines the government's ability to obtain value for the taxpayer's dollar (GAO, 2001a). It also highlighted the DoD's difficulties in defining requirements, providing sufficient contractor oversight, and adequately staffing contracting professionals. Another GAO report (2001b), reiterated findings concerning DoD deficiencies in service contract management and made three recommendations: appoint a Chief Acquisition Officer for each agency, improve training of the acquisition workforce, and increase the use of performance-based contracting. To date, improvements in acquisition training and the implementation of the role of the Chief Acquisition Officer have not been fully realized (Falcone, 2010; GAO, 2010b).

In 2006, the GAO issued another report stating that the DoD still had not implemented a strategic approach to the management of service contracts (GAO, 2006a). Rather, the GAO found that the DoD was reactively managing its service contracts, due in part to a lack of information on service requirements, volume, and composition. The DoD concurred with these findings and the Under Secretary of Defense for Acquisition, Technology and Logistics (USD [AT&L]) issued a policy memorandum to strengthen the management of DoD services acquisition (USD[AT&L], 2006). This memorandum called for reform at the strategic and tactical levels to ensure services acquisitions were enhancing the



capabilities of the warfighter and achieving specific objectives such as the use of performance-based measures, contract action reporting, and regulatory compliance. Additionally, the memorandum implemented the changes required by Section 812 of the National Defense Authorization Act for Fiscal Year 2006, which required the DoD to establish a management structure for the acquisition of contract services.

Despite these changes, the GAO saw little improvement in the DoD's acquisition and management of services. The DoD increasingly relies on defense contractors for business-to-business services but lacks the key elements at the strategic and tactical levels to make service contracts a managed outcome (GAO, 2007a). The GAO then questioned whether the DoD applies sound business practices to the acquisition and management of contracted services in: defining requirements, obtaining adequate competition, managing contractors in a deployed environment, assessing contractor performance, and executing interagency contracts and task orders (GAO, 2007b).

Recent legislation passed within the National Defense Authorization Act of 2008 required the DoD to submit to congress an annual inventory of contracted services and required the Secretary of Defense to issue guidance providing for periodic independent management reviews of the department's service contracts. The DoD's resultant guidance memorandum required contract "peer reviews" at the DoD level for service acquisitions above one billion dollars and placed the responsibility of conducting reviews within each component for all other service acquisitions falling below that threshold. However, the GAO recently contested the effectiveness of these policies, asserting that the same pattern of service acquisition mismanagement still exists within the DoD (GAO, 2009c).

The DoD has also been highly scrutinized for its lack of compliance with contracting-related statutes and regulations. Recent reports have highlighted compliance issues ranging from a lack of required documentation, such as determinations and findings for the use of time and materials contracts (GAO, 2007c), to issues meeting competition requirements (DoDIG, 2010a; GAO, 2004) and managing and definitizing undefinitized contractual actions (DoDIG, 2004, 2010b; GAO, 2007d, 2010a).

But why is the DoD experiencing so much trouble with the acquisition and management of contract services? For-profit-sector organizations are not immune. Like the DoD, firms are spending increasingly more on outsourced services but resources dedicated to manage them have not kept pace (Ellram et al., 2007). Additionally, overworked services acquisition personnel often use supplier-provided information to determine the cost structure and cost drivers of acquired services (Ellram et al., 2007).

In order to improve the performance of service contract management within the U.S. Air Force, or the DoD as a whole, the determinants of performance need to be identified. Once this is known, leaders in public procurement can more effectively allocate resources towards those factors that have greater impacts and avoid the inefficient use of resources on those factors that have little or no impacts. The objective of this research, therefore, is to address existing gaps in the literature and offer service contract practitioners a comprehensive model to improve the acquisition of service contracts while increasing compliance with federal, DoD, and Service acquisition regulations.

To accomplish this, we first scan relevant theories to identify factors that should affect service quality. We then combine the relevant antecedents into a structural equation model that explains service quality. The remainder of this work is organized as follows. First, the study discusses the conceptual framework and proposed hypotheses. Next, the study presents the research design and methodology. Then, the study provides an analysis



of the proposed models and reports the findings. Lastly, the study offers a summary discussion, including conclusions and implications.

## **Conceptual Framework and Hypotheses**

### ***Service Quality***

Quality is an immensely important yet fleeting measure for firm success (Anderson & Zeithaml, 1984) in that it is not easily articulated by service providers or by customers (Takeuchi & Quelch, 1983). Services differ drastically in nature from goods—primarily through the four characteristics of intangibility, heterogeneity, perishability, and inseparability (Ellram et al., 2007). First, the intangible nature of services renders specifications and customer expectations to be imprecise (Ellram et al., 2007). Second, services are, by nature, heterogeneous. This is especially true of services with a high labor content as performance will vary between providers and will likely differ between customers and with time (Parasuraman, Zeithaml, & Berry, 1985). Like providers, customers also lack a homogenous definition of service quality for many specified services. Because of this, and since consistency in levels of performance from service personnel is difficult to attain, the level of quality that a service provider expects to deliver may vary greatly from the level of quality that the customer expects to receive (Parasuraman et al., 1985). Third, services are frequently perishable; unlike goods, services cannot be held or stocked in inventory. Whereas inventory policies for goods allow firms to buffer future demand with safety stock, service providers must change service capacity to meet demand fluctuations (Ellram et al., 2007). The perishability of services also presents challenges for inspection; service outcomes for many services can only be inspected or evaluated at the time of service performance. For example, security guard services cannot be rendered for a previous period of time nor can the services be easily inspected or evaluated after a period of performance is complete. Fourth, the production and consumption of services are often inseparable. Quality in a service environment often occurs through interactions between the customer and the service provider (Lehtinen & Lehtinen 1982). These interactions become even more influential to quality in services where higher degrees of customer input is required (Parasuraman et al., 1985), such as with real estate services.

Parasuraman et al. (1985) developed a conceptual model of service quality based on gaps between perceptions and expectations of service tasks and quality. The first gap is between the consumer's expected service and the service provider's perception of consumer expectations. The second gap is the difference between the service provider's perceptions of consumer expectation and the translation of those perceptions into corporate specifications for service quality. The third gap is the difference between the corporate specifications for service quality and the actual service performance. In the authors' investigation, executives of service-delivery firms routinely stressed the critical function of service employees. Therefore, the depth of this gap is contingent on the difference between the performance of the firm's service delivery employees and the specifications established by the firm. The fourth gap is the difference between advertized service delivery and actual service performance. Finally, the authors conclude that the fifth gap, which is the total difference between the consumer's expected level of service and the perceived level of service received, is, by design, a function of all earlier gaps.

Parasuraman et al. (1988) empirically derived five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. Other factors shaping the customer's expectations of service quality may include the customer's past experience, personal needs, and word-of-mouth communications. While the works of Parasuraman et

al. (1985) and Cronin and Taylor (1992) have significantly advanced service quality theory, their research has been limited to applications of service quality in business-to-consumer (B2C) contexts. The five dimensions of service quality do not always fit B2B services due to many services that are either specified by the buyer or do not involve face-to-face interaction with service provider employees (e.g., aircraft maintenance).

### ***Regulatory and Statutory Compliance***

The government's purchasers, administrators, and inspectors of services are tasked with ensuring compliance to the multitude of federal regulations and statutes collectively referred to as the Federal Acquisition System (FAR, 2005; Riddell, 1985). FAR 1.102 states that the use of the Federal Acquisition System will satisfy the customer in terms of quality, among other objectives, as a guiding principle. However, the U.S. Air Force and the DoD have come under much scrutiny regarding compliance with procurement regulations and statutes. Not all cases of non-compliance are due to fraud, waste, or abuse; in fact, many cases are simply the result of unknowledgeable and inadequately trained personnel, an effect of large-scale increases in agency contracting without commiserate changes to hiring or training practices, termed "corruption by incompetence" by Cohen and Eimicke (2008, p. 30). Non-compliance with regulations and statutes undermines acquisition policy objectives and often thwarts those procedures established to ensure that the government receives best value for the taxpayer dollar. Therefore, it is hypothesized that,

*Hypothesis 1: The greater the compliance with regulations and statutes, the greater the service quality.*

### ***Requirement Definition***

Purchasers of goods and services must clearly define requirements (i.e., desired outcomes) to properly achieve acquisition objectives. In the gaps model, one or more gaps exist between the buyer's expectations of the service and the supplier's interpretation of buyer expectations. Since the supplier's interpretation of the buyer's expectations ultimately affects the level of service performance, the buyer's perception of the quality of actual service delivery is largely dependent upon the alignment between buyer expectations and the supplier's interpretation of those expectations. Buyers of customer-defined B2B services often state service expectations in requirement documents that are incorporated into contracts.

Within public procurement, Title 10 U.S.C. section 2305 requires purchasers to state government specifications in terms of function, performance, or design requirements. However, when acquiring services, specification and measurement of the required level of quality is often more complex than when acquiring goods (Brynste, 1996). Recent reports have highlighted several instances of decreased acquisition outcomes due to insufficiently defined service requirements (GAO, 2002, 2007b, 2009d). To address some of these issues, the USD(AT&L) has recently called for the strengthening of services requirements documents through the use of standardized work statements and the establishment of market research teams at the portfolio management level (USD[AT&L], 2010b). Even with these additional tools, the added complexity of differing interpretations of requirements documents by the buyer and supplier renders the exact communication of the contents of the service and desired service level to be nearly impossible. Without a complete understanding of the buyer's service requirement, a supplier may not perform tasks that the government expects to receive under the terms of the contract, may not meet the buyer's expectations in terms of function, performance, and quality, or may not perform those



functions necessary for the contract to adhere to regulations, statutes, and policy. Therefore,

*Hypothesis 2: There will be a direct, positive relationship between sufficiency of the requirement definition and service quality.*

*Hypothesis 3: There will be a direct, positive relationship between the sufficiency of the requirement definition and regulatory and statutory compliance.*

Recent literature has indicated that an early involvement of suppliers into supply chains may produce positive outcomes for both buyers and suppliers (see, for example, Handfield, Ragatz, Petersen, & Monczka, 1999; Seshadri, 2005). Bricoe, Dainty, Millett, and Neal (2004) found that the early involvement of suppliers resulted in increased integration into the supply chain, improvements to schedule, and a better understanding of client needs and objectives. With respect to services acquisitions, Briscoe et al.'s (2004) conclusion represents a logical outcome as purchasing organizations step away from an introverted approach to procurement planning and capitalize on the expertise of suppliers who are often more experienced and knowledgeable in their respective industries than the purchasing organization's buyers. As such,

*Hypothesis 4: The greater the extent the contractor defines requirements, the greater the service quality.*

*Hypothesis 5: The greater the extent the contractor defines requirements, the greater the sufficiency of the requirement definition.*

### **Relational Exchange**

Relational Contract Theory was introduced by Macneil (1980), who contended that relationships, rather than discrete transactions, are at the core of contracts. Morgan and Hunt (1994) developed the Commitment-trust Theory for relational marketing whereby commitment and trust are central because they encourage marketers to work towards preserving investments in relationships through cooperation, favor beneficial long-term partnerships over short-term, volatile pacts, and consider higher-risk endeavors without fear of partners acting in opportunistic manners. Commitment is a long-term desire to maintain a relationship which is considered to be important or valuable while trust is a reflection of willingness to depend on a business partner. In Morgan and Hunt's model, communication is a precursor to trust which ultimately results in successful relational exchanges between parties by providing a mechanism for partners to resolve disputes, align their expectations and perceptions, and jointly develop strategies (Wittmann, Hunt, & Arnett, 2009).

Two of the procurement theories explaining firm governance are relational exchange and transaction cost economics (TCE). TCE theory suggests that activities will be outsourced when transaction costs are lower than the cost of performing the work in-house (Williamson, 1975). Transaction costs of contracting in the market include the costs of writing and negotiating contracts and the costs of monitoring suppliers—actions needed to thwart supplier opportunism. Relational exchange offers a more efficient alternative to governing suppliers than detailed contracts and oversight. By establishing trust and commitment, suppliers need not be monitored as closely nor does the contract need to be written as thoroughly. After all, even the most thorough contracts cannot possibly cover all contingencies. Numerous positive effects of relational exchange include increased cooperation (Morgan & Hunt, 1994), reduced opportunism (Brown, Dev, & Lee, 2000; Joshi & Stump, 1999), increased performance (Skarmetas, Katsikeas, & Schlegelmilch, 2002), and increased satisfaction and service quality (Paulin, Perrien, & Ferguson, 1997). Therefore,





given the centrality of relational exchange, any study of B2B exchange should include the effects of relational norms.

When contracting for services, proper communication between a services purchaser, contractor, and end user is critically important to handle variations or unforeseen events in service delivery (Bryntse, 1996). Cohen and Eimicke (2008) include several forms of government-contractor communication problems among their list of top issues within public procurement. First, they argue that poor communication between the government and the contractor's management team often produces an unacceptable level of performance and causes conflicts between the parties, particularly when communication issues result in poorly defined tasks or when projects fail. Similarly, they reason that communication issues between the government and the contractor's employees may result in employee confusion regarding direction on tasks or assignments. In these situations, the contractor's employees are often forced to establish direction and solve problems internally, which may result in methods or levels of performance that do not match the government's expectations. In parallel with this line of reasoning, inadequate communication between the government and the contractor's employees may result in undesirable contractor performance on those actions required to ensure compliance with the government's procurement policies. Kong and Mayo (1993) emphasize the need for supply chain members to integrate (i.e., high involvement and frequency of contact) the respective functional areas of each firm in order to minimize gaps and maximize service levels to the end consumer. Likewise, they also warn that where buyer-supplier interfaces are constrained (i.e., cross-functional, cross-organizational, dialogue is controlled or stymied), gaps in service delivery will occur. This is logical—particularly where requirements documents inadequately define expectations and needs. Where specifications are vague, communication can fill the void. As such,

*Hypothesis 6: The greater the communication between the government and the contractor, the greater the service quality.*

*Hypothesis 7: The greater the communication between the government and the contractor, the greater the regulatory and statutory compliance.*

### **Agency Theory**

In agency theory, the agency relationship is defined as an agreement in which at least one person, the principal, delegates duties and some decision-making authority to another, the agent (Jensen & Meckling, 1976). Jensen and Meckling (1976) describe the agency problem as the likelihood that the agent will not act in the interest of the principal if both parties seek to maximize their utility. Eisenhardt (1989) asserts that two fundamental problems may occur in principal-agent relationships. The first problem will ensue when the principal and agent have conflicting goals and it is either difficult or expensive for the principal to monitor the agent. The second problem occurs when the principal and agent have different attitudes towards accepting risk. The principal can limit actions by the agent that are misaligned with the principal's interests by expending additional resources on monitoring the agent, by offering incentives, or by paying for the agent's bonding. Therefore, the cost of the agency relationship is the sum of these three actions by the principal (Jensen & Meckling, 1976).

Within public procurement, a misalignment of interests between the government (principal) and a contractor (agent) is typically identified through the use of surveillance methods, often termed *quality assurance*. Surveillance is necessary to ensure service quality in public procurements (Lam, 2008). Service quality is as dependent on post-award management of performance as it is on pre-award specification of service requirements and



source selection (Axelsson & Wynstra, 2002). Despite this, the GAO found that contracting activities within the DoD typically place a far greater emphasis on awarding service contracts than on ensuring that trained and knowledgeable quality assurance personnel are assigned prior to contract award (GAO, 2005a). The GAO also reports that these actions reduce the government's ability to assure that service suppliers are providing timely and quality services and mitigating performance problems. Therefore,

*Hypothesis 8: The greater the amount of government surveillance of contractor performance, the greater the service quality.*

The federal government and the DoD prescribe performance-based services acquisition (PBSA) procedures to address agency problems which occur in the acquisition of services. Most notably, PBSA promotes the procurement of commercial services and promotes contractor innovations through the use of outcome-based requirement definitions, as opposed to requirement definitions that specify the inputs and tasks necessary for performance (USD[AT&L], 2000). The Office of Federal Procurement Policy (OFPP) enumerated four requirements which, at a minimum, must be included in a service contract for the proper implementation of PBSA procedures: an outcome-based requirement definition, performance standards that are tied to requirements, a government-developed plan for monitoring contractor performance against performance standards, and, when appropriate, positive and negative performance incentives (OFPP, 1997). Although the DoD has had some issues fully implementing PBSA procedures (see, for example, Ausink, Baldwin, Hunter, & Shirley, 2002; GAO, 2002b), the use of PBSA in public procurement has been linked to improved acquisition outcomes, most notably reduced cost and improved performance (OFPP, 1998). As such,

*Hypothesis 9: The greater extent to which performance-based services acquisition procedures are used, the greater the service quality.*

### **Resource-Based View of the Firm**

The resource-based view of the firm states that a firm's competitive advantage in the marketplace is based on its ability to acquire and maintain valuable resources important to production (Connor, 1991). Resources are a firm's physical capital, human capital, and organizational capital that improve efficiency or effectiveness (Barney, 1991). For a firm to build a sustained competitive advantage, defined as a competitive advantage that lasts a long period of time (Jacobsen, 1988), firms must possess resources that are rare, valuable, imperfectly imitable, and non-substitutable by other resources that are valuable but neither rare nor imperfectly imitable (Barney, 1991).

In terms of the acquisition of services in the U.S. Air Force, alliance resources include acquisition personnel and the time allotted for those personnel to perform all of the functions necessary for the acquisition of the service. First, the sufficiency of the procurement lead-time varies between procurements. The length of this period may determine how well the requirement is defined, the amount or depth of market research that is performed, the appropriateness of the acquisition strategy, and the ability of the contracting activity to comply with applicable directives such as advertising requirements, competing requirements, applying appropriate socio-economic strategies (e.g., set-asides), documenting determinations and findings, and conducting solicitation and contract reviews. As such, it is posited that,

*Hypothesis 10: The greater the sufficiency of procurement lead-time, the greater the service quality.*



*Hypothesis 11: The greater the sufficiency of procurement lead-time, the greater the compliance with regulations and statutes.*

*Hypothesis 12: The greater the sufficiency of procurement lead-time, the greater the sufficiency of the requirement definition.*

As a resource in the purchaser-supplier alliance, the assignment of an adequate number of personnel to perform contract award and administration functions is crucial to the acquisition's overall success. Recent reports by the DoD Inspector General highlighted issues resulting from insufficient manpower and increased turnover due to acquisition workforce reductions (DoDIG, 2000a, 2000b, 2003). Several key areas in which problems were noted include increased program costs, reduced scrutiny and timeliness in reviewing acquisition actions, lost opportunities to develop cost-saving initiatives, insufficient staff to manage requirements, and increased backlogs in closing out completed contracts (DoDIG, 2000a). In particular, the excessive turnover of acquisition personnel threatens the long-term success of acquisitions as government administration functions that are required by contract terms, regulations, or statutes may not be properly accomplished (Office of the Special Inspector General for Iraq Reconstruction [SIGIR], 2008). Research has generally supported the deleterious effects of high levels of employee turnover on organizational performance (Glebbeeck & Bax, 2004; Huselid, 1995). Schlesinger and Heskett (1991) asserted that high employee turnover in service organizations results in long-term decreases in sales and profitability as well as in lower levels of service quality. Therefore, it is posited that:

*Hypothesis 13: The greater the turnover of government acquisition personnel, the lesser the service quality.*

*Hypothesis 14: The greater the turnover of government acquisition personnel, the lesser the compliance with regulations and statutes.*

### **Competence-Based View of the Firm**

The competence-based view provides that competitive advantage is a function of the firm's core competencies. A core competence represents the collective learning in an organization (Prahalad & Hamel, 1990). Econom (2006) argues that federal agencies must consider contract management as a core competency since the functions performed by third-party contractors are often essential in successfully achieving organizational goals and concludes that the success of the buying organization is largely dependent on hiring personnel who possess the right mix of skills, abilities, experience, and training. The right mix of skills is critical to achieving contract performance outcomes (United States Merit Systems Protection Board, 2005). Within services acquisition, education, training, and experience are enablers for the purchasing organization to effectively deploy assets to achieve acquisition objectives. Those individuals with the greatest breadth of education, training, and experience may be capable of effectively purchasing and administering a wider range of service contracts. While the development of knowledge may be a result of broad-based practical and educational exposure, experience is often a function of time spent performing tasks. Purchaser education may be reflected by the attainment of degrees or professional certifications. The level of training of the federal acquisition workforce is measured using the Acquisition Professional Development Program (APDP), which offers three levels of certifications in several areas of acquisition based on completion of training courses and modules, on-the-job experience (time), and level of education. In practice, federal acquisition personnel who demonstrate a capability for increased responsibility through competencies of education, training, and work experience may be assigned to





award or administer acquisitions that are more complex, requiring compliance with increased numbers of regulations and statutes. As such,

*Hypothesis 15: There will be a direct, positive relationship between the amount of contract administrator experience and the sufficiency of the requirement definition.*

*Hypothesis 16: There will be a direct, positive relationship between the amount of contract administrator experience and regulatory and statutory compliance.*

*Hypothesis 17: The greater the contract administrator's APDP certification level, the greater the sufficiency of the requirement definition.*

*Hypothesis 18: The greater the contract administrator's APDP certification level, the greater the regulatory and statutory compliance.*

*Hypothesis 19: The greater the contract administrator's education level, the greater the sufficiency of the requirement definition.*

*Hypothesis 20: The greater the contract administrator's education level, the greater the regulatory and statutory compliance.*

### **Internal Customer Commitment**

The many roles of the internal customer are critical to the success of a supply chain throughout the lifecycle. The internal customer often provides the necessary funding to acquire the service. This level of funding may permit the use of certain performance-based incentives if appropriate for the contractual action. Second, the internal customer plays an integral role in the generation of requirement documents such as the statement of work. Third, the internal customer must devote manpower to the services acquisition for: (1) the evaluation of offers throughout the source selection process, (2) the performance of quality-assurance, and (3) for management of the requirement to include contract-change requests, development of past performance information, and the determination of performance-based incentive awards. This level of manpower is often based on manpower standards which allocate full-time positions based on the number of contracts that a unit manages, among other factors (Reed, 2010; U.S. Air Force, 2001). In such a situation, the assignment of available personnel against contracts within a unit's portfolio would be an indication of the level of commitment to each acquisition. Without an acceptable level of commitment from the internal customer to properly conduct the acquisition, adequate standards for the level of service quality may not be established and the contract may not be effectively managed after award. As such,

*Hypothesis 21: The greater the internal customer's commitment to the service acquisition, the greater the compliance with regulations and statutes.*

*Hypothesis 22: The greater the internal customer's commitment to the service acquisition, the greater the sufficiency of the requirement definition.*

### **Methodology**

This study employed a mixed design (Creswell, 2003) of qualitative and quantitative analysis in order to provide a more accurate and holistic perspective of the phenomena (Boyer & Swink, 2008). The qualitative work involved discussions with academicians and practitioners to ensure the proposed model achieved face validity and used valid measures of constructs. Next, the research employed structural equation modeling using cross-sectional survey data in order to test the hypotheses (see Figure 1). The remainder of this



section details the survey development, the sample, data collection, and reliability and validity.

### Questionnaire Design and Construct Measurement

Survey items were assessed on a seven-point Likert-type scale. The latent constructs were measured using or adapting existing scales of established validity. Scales were not available for the sufficiency of the requirement definition and the sufficiency of lead time; thus, we created them based on our dialogue with practitioners.

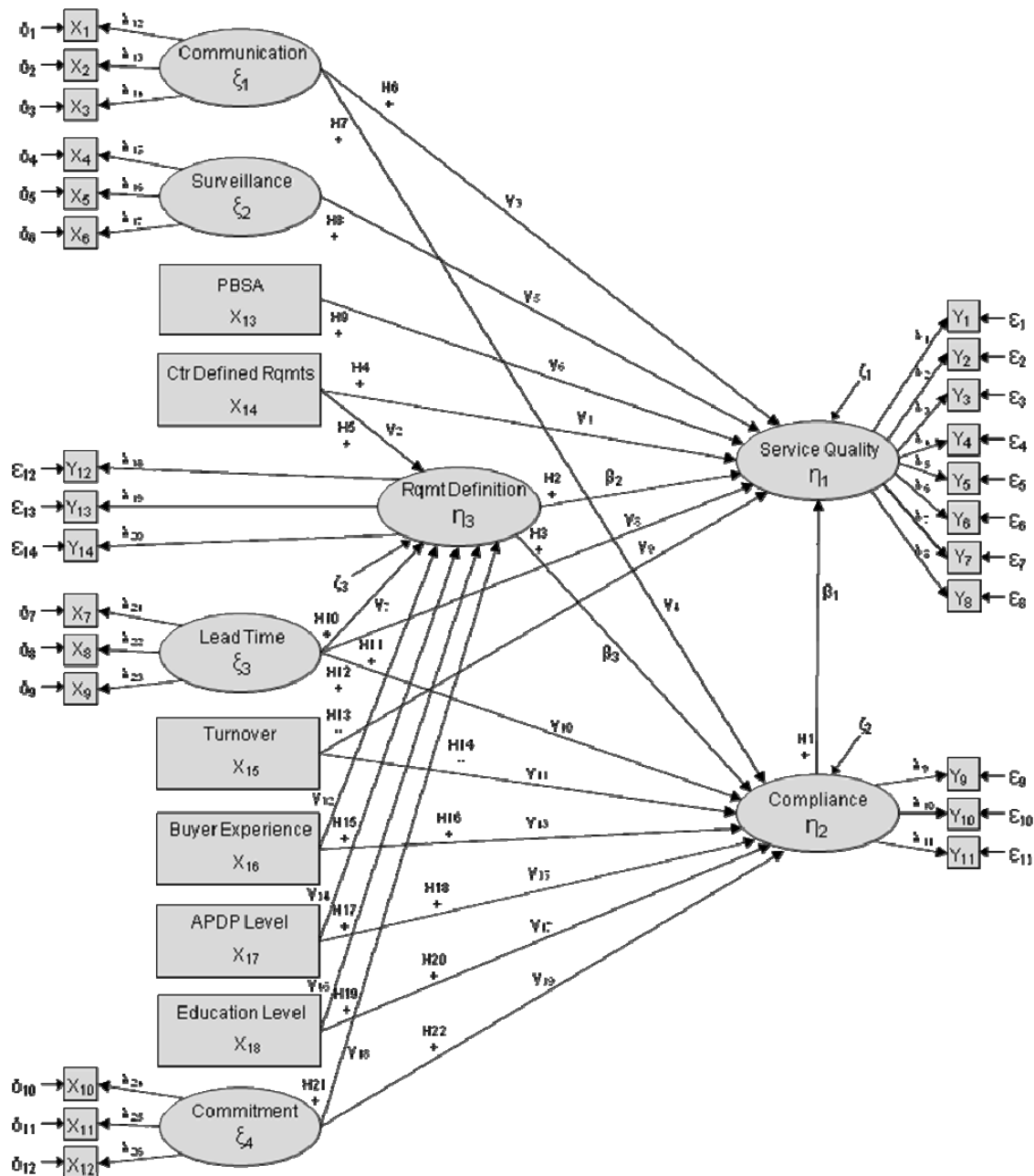


Figure 1. Path Diagram of Hypothesized Structural Model

## **Data Collection**

An online survey was used to collect the data. Because it is difficult to identify personnel who manage service contracts, an invitation was forwarded via e-mail to eligible individuals through supervisors of U.S. Air Force contracting units. Of the 60 units invited to participate in the study, 42 units agreed and distributed the survey to 743 personnel who administer service contracts. Of the 743 potential participants, 252 individuals responded, yielding a 34% response rate, which is consistent with rates reported for web-based surveys (Larson, 2005). Within these responses, 12 were later discarded due to missing, faulty, or inconsistent responses.

From the 240 usable responses, the average respondent was 41.7 years old and had 11.7 years of sourcing experience. The gender of respondents was nearly even, with males accounting for 51.9% of respondents and females accounting for 48.1% of respondents. Respondents had a diverse range of educational experience, with the highest level of education for 11.9% of respondents being a high school diploma or general equivalency diploma, the highest level of education for 12.3% of respondents being an associate's degree, the highest level of education for 43.2% of respondents being a bachelor's degree, and the highest level of education for 31.7% of respondents being a master's degree. Only two respondents, or 0.8%, held a doctoral or professional degree. Additionally, a wide range of types of services was represented.

## **Reliability and Validity**

Through iterative scale purification (Churchill, 1979), 43 survey items reduced to 26 across the seven latent factors. Composite reliabilities (Fornell & Larcker, 1981), ranging from 0.76 to 0.96, exceeded the minimum acceptable threshold of 0.7 (Nunnally, 1978) providing evidence of reliability. Construct validity was assessed through confirmatory factor analysis (CFA) using structural equation modeling in Mplus version 6.0. Separate models were run for exogenous and endogenous constructs (Byrne, 2010). Covariances were used as input data. All loadings were significant at the 0.05 level, and their standard errors were not abnormal. No standardized loadings exceeded 1.0, and no negative error variances (Heywood Case) occurred. The chi square test was not significant for the exogenous measurement model ( $\chi^2_{(48)} = 52.72, p < .30$ ), but was significant ( $\chi^2_{(75)} = 127.63, p < .001$ ) for the endogenous model indicating a difference between the hypothesized endogenous model and the data. However, a global assessment (Bagozzi & Yi, 1988) of the various goodness of fit indices indicated good fit. The values for CFI (1.00 exogenous; 0.98 endogenous) and TLI (1.00 exogenous; 0.98 endogenous) are both higher than the 0.95 minimums (Hair, Black, Babin, & Anderson, 2010), suggesting good fit. Similarly, the RMSEA (0.02 exogenous; 0.06 endogenous) and Standard Root Mean Square Residual (SRMR; 0.03 exogenous; 0.03 endogenous) values are less than the thresholds proposed by Hair et al. (2010), who recommended maximum values of 0.08 each. The models demonstrated solid fit indices and statistically significant path coefficients loading on the intended factors, indicative of convergent validity (Anderson & Gerbing, 1988). The average variance extracted (AVE) by each construct exceeded the 0.50 standard demonstrating convergent validity (Fornell & Larcker, 1981). We then compared each AVE to the variance shared between constructs. None of the shared variances approached the AVE, providing sufficient evidence that the constructs were indeed unique (Lam, Shankar, & Murthy, 2004). We tested for nonresponse bias using Armstrong & Overton's (1977) approach. Tests for differences in three latent constructs and two demographic variables revealed no significant differences, indicating a lack of response bias in the data.



## Results

The SEM model was fitted to the data; Table 1 displays the results. We used Mplus software to compute maximum likelihood estimations of parameter values based on the variance/covariance matrix. We assessed several fit indices including those suggested by Bagozzi and Yi (1988), Bentler (1992), and Hair et al. (2010). While the chi square statistic was significant ( $\chi^2(404 \text{ d.f.}) = 532.26, p < .001$ ), a global assessment of alternative fit indices supports the model. The SRMR of 0.05 is lower than the 0.08 threshold (Hair et al., 2010). Additionally, the ratio of chi squared-to-degrees of freedom (1.32) is lower than the standard of two (Carmines & McIver, 1981), further suggesting a good fit. The values for CFI (0.97) and TLI (0.97) are both higher than the 0.95 minimums (Hair et al., 2010), suggesting good fit. Table 1 displays the results of the structural equation model. The determinants examined in the model explain 30% of the variance in the sufficiency of the requirement definition and 66% of the variance in service quality.

In the interest of achieving a more parsimonious model (see Figure 2), paths with nonsignificant relationships were removed. The chi-square value of 360.61 is significant with a  $p$ -value of less than 0.001. While this suggests that fit may be less than adequate, the relative chi-square value is 1.41 and less than the 3.00 recommended threshold, indicating good fit to the sample data. As before, a global assessment of fit was also performed using CFI, TLI, RMSEA, and SRMR because the chi-square test is not representative of higher order models and tends to penalize for complexity and larger samples. The values for CFI and TLI are both higher than the 0.95 minimums that were proposed by Hair et al. (2010), suggesting good fit. Similarly, the RMSEA and SRMR values of 0.04 and 0.06 are less than the thresholds proposed by Hair et al. (2010), who recommend maximum values of 0.08 each. Overall, the trimmed structural model appears to fit well to the sample data.

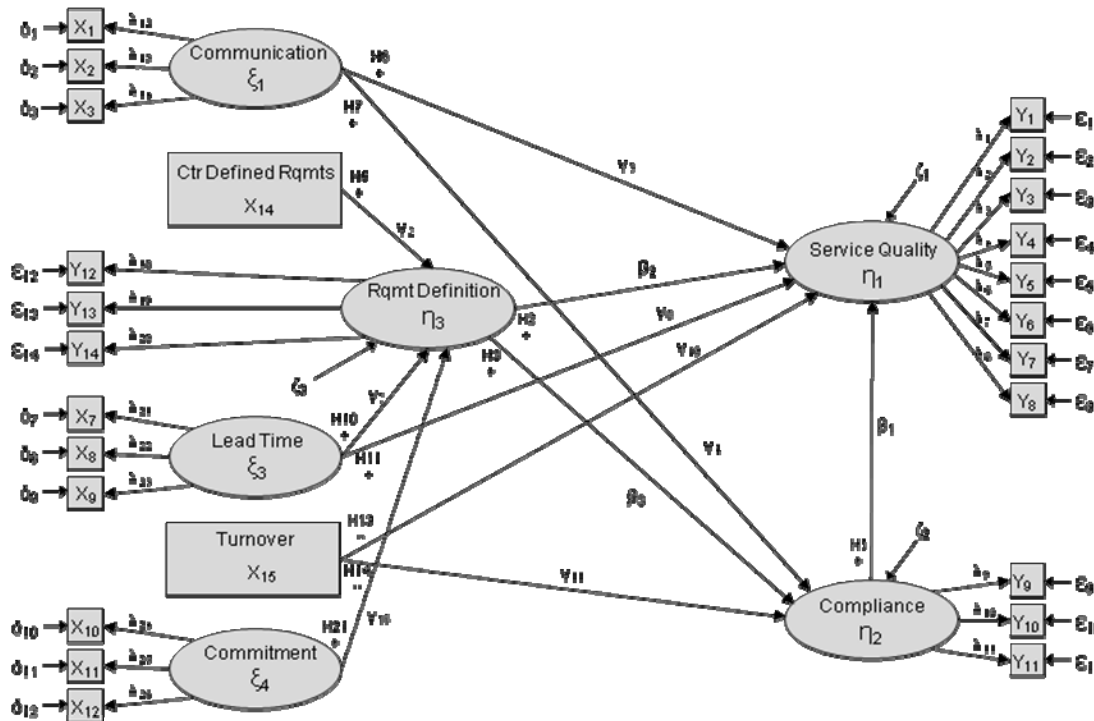


Figure 2. Trimmed Model

A review of the standardized path and loading estimates reveals all loadings to be significant with p-values less than 0.001. Additionally, path estimates for all hypothesized relationships are either significant with a p-value of less than 0.05, marginally significant with a p-value greater than 0.05 but less than 0.10, or meet the inclusion criteria of having a critical ratio greater than 1.0. The coefficient of determination ( $R^2$ ) for the endogenous variable *service quality* was relatively high, at 0.651, indicating a high degree of explanatory power.  $R^2$  was greater than 0.30 for the other two endogenous variables, *regulatory and statutory compliance* and *requirement definition sufficiency*, indicating a moderate degree of explanatory power. The models presented in this study are considered to be non-nested since several latent and manifest exogenous variables have been removed from the hypothesized model. As such, it is appropriate to identify the best model through a comparison of AIC and BIC, which were obtained from the SEM output produced by Mplus Version 6.0. The trimmed model presents lower values for both criteria and can, therefore, be considered the most preferred model of the two. Overall, support was found for  $H_2$ ,  $H_3$ ,  $H_6$ ,  $H_7$ ,  $H_{12}$ ,  $H_{14}$ , and  $H_{22}$ . A comparison of models is shown in Table 1.

**Table 1. Test of Hypotheses: Estimates of Structural Equations Model**

Tests of Hypotheses		Full Model		Trimmed Model	
		Standardized Estimate	t-value	Standardized Estimate	t-value
Compliance to Service Quality	$H_1^{ac}$	<b>-.25</b>	<b>-3.41</b>	<b>-.24</b>	<b>-3.32</b>
Rqmt Definition to Service Quality	$H_2^a$	<b>.18</b>	<b>2.72</b>	<b>.17</b>	<b>2.61</b>
Rqmt Definition to Compliance	$H_3^b$	<b>.15</b>	<b>1.94</b>	<b>.14</b>	<b>1.95</b>
Contractor defined rqmt to Service Quality	$H_4$	.03	.53		
Contractor defined rqmt to Rqmt Definition	$H_5^{bc}$	<b>-.11</b>	<b>-1.88</b>	<b>-.11</b>	<b>-1.93</b>
Communication to Service Quality	$H_6^a$	<b>.93</b>	<b>11.77</b>	<b>.93</b>	<b>12.92</b>
Communication to Compliance	$H_7^a$	<b>.58</b>	<b>6.96</b>	<b>.07</b>	<b>8.06</b>
Surveillance to Service Quality	$H_8$	.05	.89		
PBSA to Service Quality	$H_9$	-.04	-.83		
Lead Time to Service Quality	$H_{10}^{ac}$	<b>-.20</b>	<b>-2.99</b>	<b>-.20</b>	<b>-3.01</b>
Lead Time to Compliance	$H_{11}$	-.03	-.34		
Lead Time to Rqmt Definition	$H_{12}^a$	<b>.32</b>	<b>4.54</b>	<b>.30</b>	<b>4.38</b>
Personnel Turnover to Service Quality	$H_{13}$	.08	1.50	.08	1.51
Personnel Turnover to Compliance	$H_{14}^b$	<b>-.09</b>	<b>-1.60</b>	<b>-.10</b>	<b>-1.74</b>
Experience to Rqmt Definition	$H_{15}$	.01	.15		
Experience to Compliance	$H_{16}$	.04	.54		
APDP Level to Rqmt Definition	$H_{17}$	.04	.59		
APDP Level to Compliance	$H_{18}$	-.07	-.93		
Education to Rqmt Definition	$H_{19}$	.03	.53		
Education to Compliance	$H_{20}$	.05	.90		
Internal Customer Commitment to Compliance	$H_{21}$	-.04	-.49		
Internal Customer Commitment to Rqmt Definition	$H_{22}^a$	<b>.38</b>	<b>5.78</b>	<b>.06</b>	<b>5.92</b>

Notes. <sup>a</sup> $p < 0.05$ ; <sup>b</sup> $p < 0.10$ ; <sup>c</sup>significant but inverse of hypothesis.

The turnover of acquisition personnel did not seem to affect service quality. To further analyze turnover, three modifications were applied to the turnover variable, *RBV2*, which represented percent turnover as a ratio of the number of times acquisition personnel had turned over to the number of acquisition personnel assigned. First, an additional variable was created as a high/low binary variable, *PTbin*, where a cut in the data occurred at about the median (1.00). Since the values of *RBV2* are calculated as ratios, responses



were coded in *PTbin* with a value of one if the number of times that acquisition personnel turned over was greater than the median of 1.00 ( $n = 130$ ). All other responses were coded with a value of zero ( $n = 110$ ).

Next, the ratio of personnel turnover was modified to represent the annualized percent turnover (*APT*) by accounting for the duration of the contract. Similar to the previous binary transformation, *APT* was also modified as a high/low binary variable where a cut in the data occurred about *APT*'s median (0.42). Within this new binary variable, *APTbin*, cases where *APT* was less than 42% were coded with a value of zero ( $n = 122$ ), while cases where *APT* was greater than or equal to 42% were coded with a value of one ( $n = 118$ ).

We compared the means of service quality (*SQ*) and regulatory and statutory compliance (*RSC*) between the two groups, low percent turnover and high percent turnover, using MANOVA. Test statistics for Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root were statistically significant ( $p < .05$ ). These results indicate that there is a significant effect of the high/low percent turnover variable on service quality and regulatory and statutory compliance when the two dependent variables are considered as a group. These group differences were further explored using univariate F-tests. There is a significant difference in the means between the two groups of *RSC* but no statistically significant difference in the means between the two groups of *SQ*. As such, additional testing using a linear regression analysis of *RSC* on *PTbin* was appropriate to estimate the coefficient size and direction. The resulting estimate was statistically significant with a standardized estimate of -0.18 ( $p < .01$ ), indicating that compliance is less on those services acquisitions where acquisition personnel turnover is greater than or equal to 100%.

Finally, we compared the means of *SQ* and *RSC* between the two groups, low annualized percent turnover and high annualized percent turnover, using MANOVA. Test statistics for Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root were statistically significant ( $p < .05$ ). These results indicate that there is a significant effect of the high/low annualized percent turnover variable on service quality and regulatory and statutory compliance when the two dependent variables are considered as a group. The group differences were explored further using univariate F-tests. There is a statistically significant difference in the means between the two groups of *RSC* but no statistically significant difference in the means between the two groups of *SQ*. As such, additional testing using a linear regression analysis of *RSC* on *PTbin* was appropriate to estimate the coefficient size and direction. The resulting estimate was statistically significant with a standardized estimate of -0.19 ( $p < .01$ ), indicating that compliance is lesser on those services acquisitions where acquisition personnel turnover is greater than or equal to 42% annually.

Further analysis was also performed to explore potential relationships between buyer experience and service quality, regulatory and statutory compliance, and requirement definition sufficiency. This regression analysis resulted in the estimation of a statistically significant negative path coefficient ( $\beta = -.13$ ;  $t = -.201$ ;  $p < .05$ ) for the binary variable representing low buyer experience. Therefore, it is concluded that low buyer experience (5 years or less) is associated with lower levels of service quality.

## Discussion

The objective of this research was to bridge a literature gap and to offer service contract practitioners a comprehensive model to better improve the acquisition of services while increasing compliance with acquisition regulations. A structural equation model of the determinants of service contract outcomes was tested using data collected from 240 U.S. Air



Force contract administrators. Many of the findings have significant implications for the government's management of service acquisitions.

We found a significant negative relationship between compliance and service quality; however, it was in the opposite direction than was anticipated. As such, service quality and compliance with regulations and statutes are somewhat mutually exclusive. Several potential explanations of this result are offered. First, it is plausible that some of the regulations and statutes are successful at achieving public policy objectives but are detrimental to achieving the expected levels of service quality. For example, competition requirements may force suppliers in highly competitive industries to lower the quantity or quality of service inputs to remain competitive in proposals, resulting in lower service levels. Additionally, if competition enables the selection of higher-performing suppliers, the act of compliance with extensive pre-solicitation policies, regulations, and statutes (e.g., excruciatingly thorough documented evaluations in order to defend a bid protest, and layers of internal reviews and approvals) may limit the time available for meaningful negotiations. Coopers and Lybrand (1994) found that compliance with regulations and statutes drives an 18% cost premium to the DoD. It is plausible that the true cost of compliance to the DoD also includes a premium on service quality.

A second possibility exists that the actions necessary to achieve compliance with the numerous regulations and statutes directly reduce the contract administrator's ability to adequately monitor and assess performance and to address deficiencies with the supplier. Compliance with labor law acts, such as the McNamara-O'Hara Service Contract Act or the Davis-Bacon Act, which require administrators to perform on-site interviews with contractor employees and review payrolls, may unduly limit the administrator's available time to manage performance.

Communication was supported as a determinant of service quality. In fact, of all the antecedents explored, its effect sizes were the largest, making communication the most influential factor. It is interesting that an aspect of relational exchange—communication—has a greater effect on key service outcomes than do any transactional processes (e.g., requirements definition and supplier monitoring) or resources (e.g., procurement lead time).

Minimizing procurement lead time is often an important goal of sourcing (Cavadias, 2004). Internal customers typically need their services quickly, and delays can be costly—financially and politically. The results show that accelerating a source selection decreases how well the buyer's need is communicated to the supplier. This, in turn, decreases service quality—as perceived by the buyer—because the buyer's expectations are less likely to be met. However, the results also showed that sufficient lead time directly decreases service quality. This appears counter to the resource-based view of the firm if time is considered a resource. However, having insufficient procurement lead time may also be an indicator of urgency. If so, the results may indicate that buyers and suppliers rally around the buyer's more urgent needs; consequently, service quality improves. However, the finding that procurement lead time is associated with less buyer experience could also mean that less critical services that are not needed as rapidly are assigned to less experienced buyers. Thus, perhaps less attention is afforded to the requirement and the buyer's source selection process is also less rigorous, directly decreasing service quality.

Contrary to conventional wisdom, transaction cost economic theory, and recent calls for improving the management of service procurements, increasing surveillance did not affect service quality. It seems prudent, therefore, that sourcing leaders—rather than assigning more inspectors or increasing surveillance events—dedicate more resources to properly defining requirements and communicating with suppliers.



## ***Managerial Implications***

The findings from this investigation of service procurements have important implications for practitioners. First, since the extent that a buyer's requirement (need) is adequately defined affects the level of service quality received, buyers should commit the resources and effort to thoroughly communicate their performance expectations to suppliers. Sufficiently documenting requirements removes the human variability (Ellram et al., 2004) in expectations from skewing service quality evaluations. This finding supports Ellram et al.'s (2007) recommendation to use concrete performance requirements. Looking deeper, this finding also suggests that the buyer should retain some degree of proficiency in the outsourced service in order to be able to adequately define the requirement. As a case in point, in 2008, the U.S. Navy delayed for one year the refurbishment of warheads because the National Nuclear Security Administration lost the requisite technical expertise (GAO, 2009b).

Second, the finding that communication was the strongest predictor of service quality is in stark contrast to the way procurement personnel are trained, educated, and developed. Rarely in their development are these valuable soft skills taught. Perhaps more time should be devoted to the development and sustainment of relational norms such as communication, solidarity, mutuality, flexibility, reciprocity, trust, commitment, and harmonization of conflict. Clearly, acquisition leaders should assign effective communicators and relationship builders to manage service procurements.

Allocating adequate procurement lead time appears to be important to achieving desired service quality—but only by improving the definition of the requirement. Opposite to the expected outcome, lead time alone decreases service quality. However, it could be attributed to services that are less important or to service procurements that are managed by less experienced buyers. More research is needed to isolate why these opposing relationships exist. What is clear is that sourcing managers should allocate more time to sourcing teams such that they can improve the definition of needs. Ellram et al. (2007) recommended that resources be allocated commensurate with the importance of the spend. This study supports the importance of allocating sufficient lead time since it improves the definition of the buyer's need. In turn, service quality is increased.

The results show that internal customers play a key role in reaping service quality from suppliers. As the individual internal customer is more committed to a successful service procurement, the requirement will be better defined. This, in turn, increases service quality. Thus, leaders should assess the level of commitment of their employees, seek those who are passionate about their work, and assign committed employees to manage service contracts. Employers can increase commitment by imposing positive and negative incentives linked to service contract outcomes. Employees who are assigned to oversee service suppliers as an "additional duty" are not as likely to adequately define the buying organizations' needs. Furthermore, the manpower standards of internal customers may need to be reviewed to determine whether units are being adequately staffed to handle service contracts.

Because compliance with regulations and statutes come at a price to service quality, acquisition leaders should revise or remove non-value added regulations and investigate which regulations and statutes are detrimental to acquisition outcomes. Compliance with burdening requirements should be examined for either the allocations of more resources or for revision or relief.





Acquisition leaders should limit the turnover of acquisition personnel to no more than 100% over the life of contracts and 42% annually. Increased levels of turnover were found to be detrimental to compliance with regulations and statutes—particularly once turnover reaches critical thresholds of 100% over the life of the contract, or 42% annually. At or above these levels, it seems that continuity is lost in the contract administration process and personnel are forced to focus resources away from compliance and toward other elements of administration in order to ensure an adequate level of performance. Although a certain level of personnel turnover may be unavoidable due to deployments, retirements, and regular rotations, managers should avoid assigning temporary personnel to manage service acquisitions and, instead, should assign those personnel who the manager best anticipates retaining throughout the life of the contract.

Agencies could integrate the service quality scale into a supplier performance-evaluation system to routinely assess the performance of suppliers. Simpson, Siguaw, and White (2002) argued for the importance of regular feedback between buyers and suppliers. The DoD's current method of rating performance—the contractor performance assessment reporting system (CPARS)—with few exceptions, only assesses performance annually and is more appropriate to inform source selection decisions than as a means of supplier improvement (Straight, 1999). Furthermore, access to CPARS data is restricted, keeping key supply chain leaders in the dark. Worse, the accuracy of the performance ratings is suspect—usually inflated—because suppliers are afforded an opportunity to rebut assessments and raters want to avoid the nontrivial effort required to resolve differences (GAO, 2009a). This “watering down effect” will no doubt persist as suppliers continue to challenge performance assessments under the Contract Disputes Act (Graham, 2011). Clearly, an improved capability to manage supplier performance is needed. Periodic ratings could address these deficiencies and could also be used to rank-order suppliers based on performance, to segment services spend by high- and low-performing suppliers, and to assess the performance of individual buying activities. As such, rather than focusing on more oversight, agencies could focus directly on improving the performance of service suppliers and the ultimate quality of those services acquired. Finally, through the implementation of a supplier performance-evaluation system based on a service quality scale and of the electronic submittal and aggregation of ratings, agencies could regularly assess the quality of acquired services at an enterprise level. Such an assessment would allow for the identification of macro-level performance trends by service type or by top suppliers, or even allow for the evaluation of overall trends resulting from policy changes or external factors.

### ***Study Limitations and Future Research Directions***

This study was not without limitations. First, because the sample was comprised of U.S. Air Force personnel, the findings may not generalize to the DoD, other federal agencies, or the private sector. This population could be extended in future research to other populations, such as another DoD Service, the DoD at-large, other federal agencies, or the for-profit sector. Additionally, a convenience sample was used which may introduce bias. Some degree of socially desirable response bias may be present for cases in which respondents were reluctant to tell the truth regarding sensitive or vulnerable areas (e.g., contract compliance). Finally, as with all self-reported data, there is a potential for common method bias (Podsakoff & Organ, 1986). Finally, future research could address the need to better measure variables that were measured in this study using single-item scales. Future studies may either attempt to use a multiple-item scale to account for measurement error or assess these extents using objective measures.



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